



Getting Started with Citizen Science

Resources from the
National Library of
Medicine

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Outreach Coordinator

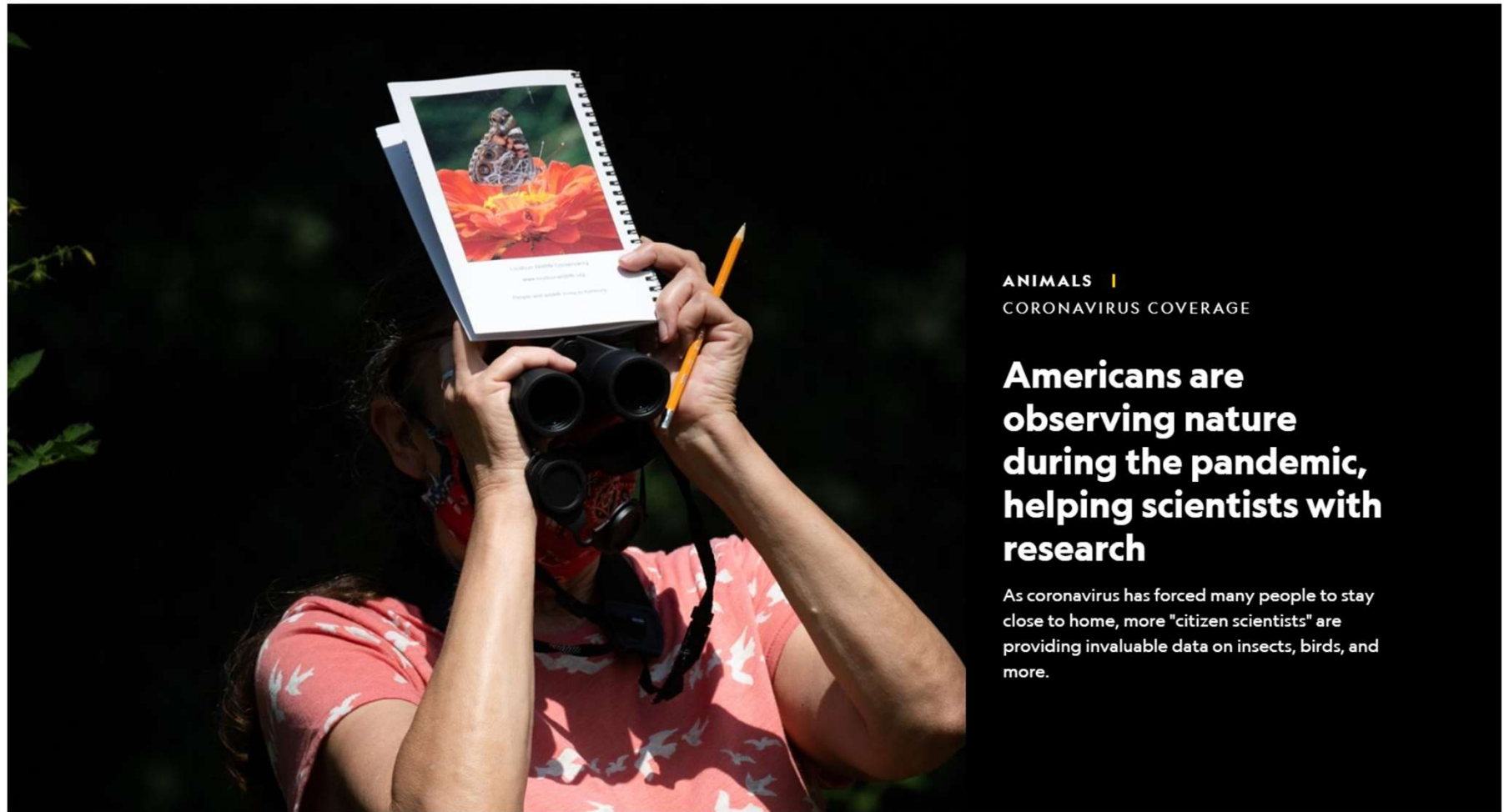
Network of the National Library of Medicine,
Pacific Northwest Region (NNLM PNR)

October 10, 2020



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*National Network of Libraries of Medicine
Pacific Northwest Region*



ANIMALS |
CORONAVIRUS COVERAGE

Americans are observing nature during the pandemic, helping scientists with research

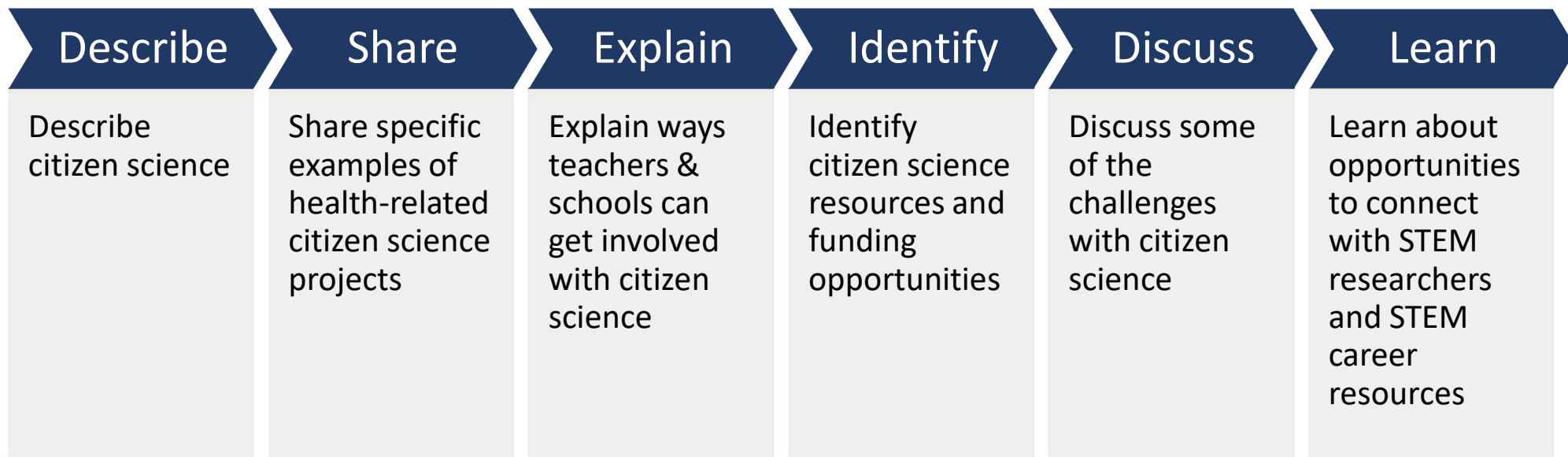
As coronavirus has forced many people to stay close to home, more "citizen scientists" are providing invaluable data on insects, birds, and more.

National Geographic, 9/8/2020: <https://www.nationalgeographic.com/animals/2020/09/citizen-science-increasing-pandemic-insects/>

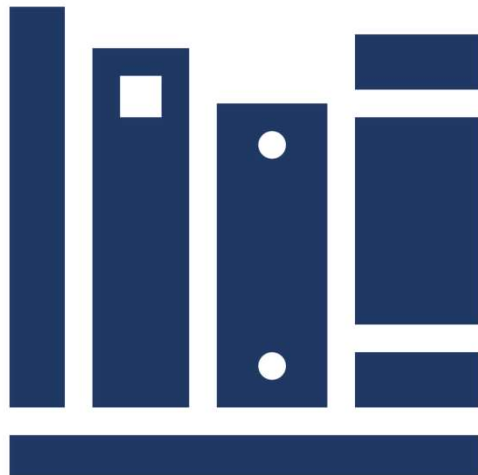


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Pacific Northwest Region

Getting Started with Citizen Science Objectives



Getting Started with Citizen Science



Introduction to the NLM and NNLM

- National Library of Medicine (NLM)
- Network of the National Library of Medicine (NNLM)

Define citizen science

NLM and SciStarter

Citizen science in schools

Information and Career Resources

Funding

Next steps and additional resources



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Network of the National Library of Medicine (NNLM)

NIH

- **National Institutes of Health**
- Nation's research agency

NLM

- **National Library of Medicine**
- World's largest biomedical library

NNLM

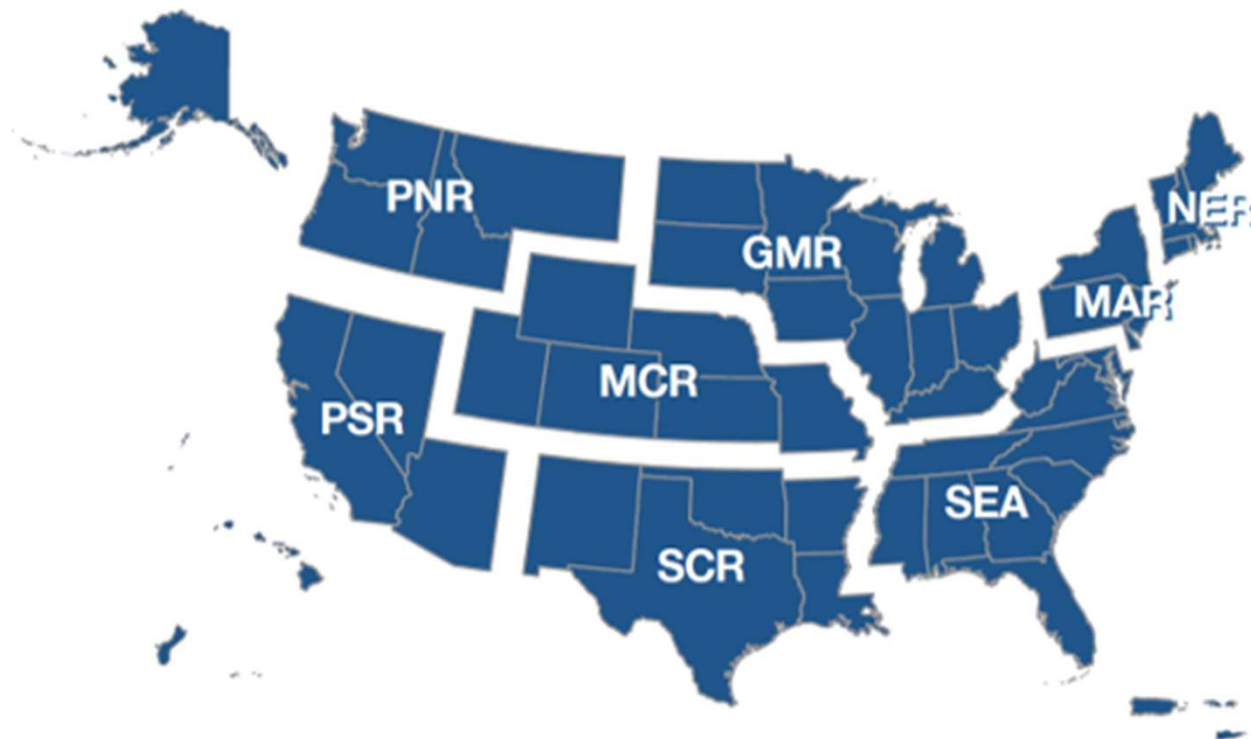
- **Network of the National Library of Medicine**
- Program of the NLM comprised of 8 Regional Libraries (RMLs) and 5 offices



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Network of the National Library of Medicine

<https://nnlm.gov>



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NNLM Mission Statement

To advance the progress of medicine and improve the public health by:

- Providing all U.S. health professionals with equal access to biomedical information.
- Improving the public's access to information to enable them to make informed decisions about their health.



Getting Started with Citizen Science



Introduction to the NLM and NNLM

Define citizen science

- Definition
- Key principles
- Citizen science in the news
- Chat: have you participated in a citizen science project?

NLM and SciStarter

Citizen science in schools

Information and Career Resources

Funding

Next steps and additional resources

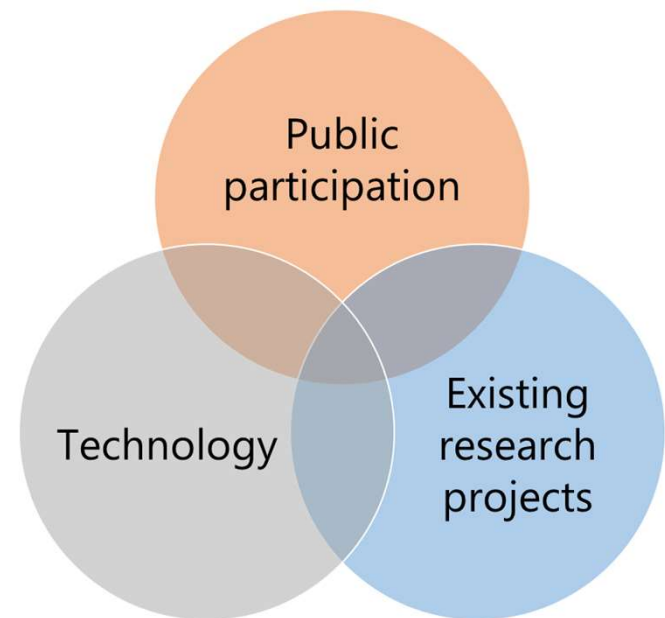


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What is citizen science?

- Anyone can participate
- Participants use the same protocol
- Data can help scientists come to real conclusions
- A wide community of scientists and volunteers work together
- Data produced is shared and public and scientists have access



10 Principles of Citizen Science

European Citizen Science Association, [The 10 Principles of Citizen Science](https://ecsa.citizen-science.net/sites/default/files/ecsa_ten_principles_of_citizen_science.pdf)

(https://ecsa.citizen-science.net/sites/default/files/ecsa_ten_principles_of_citizen_science.pdf)

1. New knowledge
2. Genuine science outcome
3. Everyone benefits
4. Participate in multiple stages
5. Receive feedback
6. Research approach
7. Open project data
8. Acknowledgment
9. Programs evaluated
10. Carefully considered



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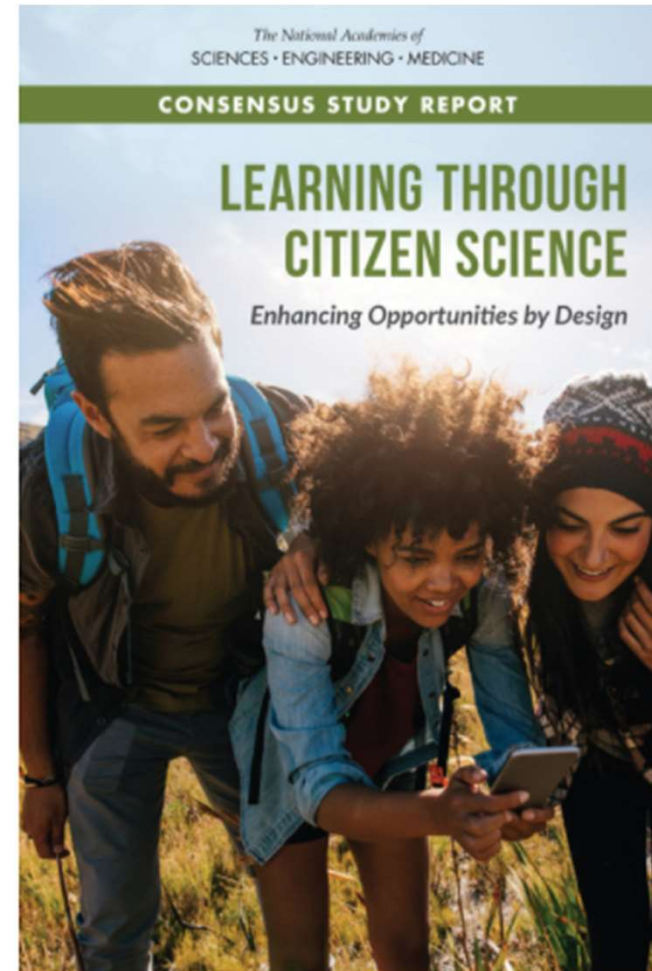
Learning Through Citizen Science: Enhancing Opportunities by Design

Key findings:

- Intentionally design to support participant learning
- Employ proven strategies during design to support participant learning
- Know the audience
- Intentionally design for diversity

National Academies of Sciences, Engineering, Medicine. (2018) Designing Citizen Science to Support Science Learning.

<https://www.nationalacademies.org/our-work/designing-citizen-science-to-support-science-learning>



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Zoological Projects

Zoology Notes & Theories

Junior citizen scientists investigate the plight of the bumblebee

The Big Bumblebee Discovery project aims to engage more than 100,000 children in mass participation experiments



▲ People across the UK are being invited to take on the role of researcher, observing and recording bumblebees as they visit lavender flowers. Photograph: Richard Becker/Alamy



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Astronomy Projects

Citizen science bags five-planet haul

By Paul Rincon
Science editor, BBC News website, Washington DC

🕒 12 January 2018

[f](#) [💬](#) [🐦](#) [✉](#) [Share](#)



A discovery by citizen scientists has led to the confirmation of a system of five planets orbiting a far-off star.

Environmental Projects

The Mercury News See ash falling? Take a picture to help...

See ash falling? Take a picture to help scientists track California wildfires like never before

As wildfires rage across California, scientists ask residents to take photos of the ash that could help us better predict their spread



Get Morning Report newsletter [SIGN UP](#)

Follow  

A Marin County Parks worker watches smoke from the Woodward Fire rise above a ridge line near Olema on Thursday, Aug. 20, 2020. (Sherry LaVars/Marin Independent Journal)

Health Projects

NASA is building models to predict mosquito-borne illnesses — and you can help

By Alex Stuckey | July 17, 2018



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Chat: Have you participated in a citizen science project?

What's in Your Backyard?

The University of Oklahoma. Citizen science soil collection program:

<https://whatsinyourbackyard.org/>



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Getting Started with Citizen Science



Introduction to the NLM and NNLM

Define citizen science

NLM and SciStarter

- NLM/ SciStarter website
- Featured projects

Citizen science in schools

Information and Career Resources

Funding

Next steps and additional resources



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NLM & SciStarter

The image shows the top section of the SciStarter website. At the top is a dark blue navigation bar. On the left is the SciStarter logo with the tagline "Science we can do together." On the right are links for "log in" and "sign up", followed by a "Quick Navigate" search bar. Below the navigation bar is a horizontal menu with links: "CitSciMonth", "Dashboard", "Project Finder", "Tools", "Events", "Podcast", "Blog", and "Partner Gateways" with a dropdown arrow. The main banner features a night sky with the Milky Way and silhouettes of people stargazing. On the left of the banner is a white box with the "CITIZEN SCIENCE MONTH APRIL 2020" logo. At the bottom left of the banner is an orange box with the text "TURN YOUR CURIOSITY INTO IMPACT." At the bottom right is a grey box with the text "GET STARTED: Sign up for a SciStarter account."

scistarter®
Science we can do together.

log in sign up Quick Navigate

CitSciMonth Dashboard Project Finder Tools Events Podcast Blog Partner Gateways ▾

**CITIZEN
SCIENCE
MONTH** APRIL 2020

**TURN YOUR CURIOSITY INTO
IMPACT.**

GET STARTED:
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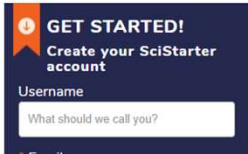
SciStarter/ NLM

scistarter.org/nlm

- Introduction to citizen science tutorial (English and Spanish)
- Recommended projects
- Links to upcoming and recorded events:
 - Talks with project scientists
 - Citizen Science Month
 - and more!


log in sign up@Girl Scouts Dashboard Project Finder Tools Events Poc

Citizen Science Month » NLM



The Network of the National Library of Medicine (NNLM), a program of the National Library of Medicine (NLM), and the All of Us Research Program supports SciStarter and Arizona State University through [Citizen Science Month](#) and the Collaborative Summer Library Program to bring health programming to your local library.
If you are affiliated with a library or community organization, learn more about how NNLM, SciStarter, and ASU can help you connect your communities to citizen science!


Welcome!

Did you know that you can help scientists answer questions about human and environmental health? Citizen science invites anyone to participate in projects that need your help from almost anywhere! You'll find an introduction to citizen science, curated projects to jump into, and more resources from our partners at the Network of the National Library of Medicine.



Introduction to Citizen Science

This interactive tutorial introduces the **who**, the **what**, the **how**, and the **why** of citizen science. Approximately 30 minutes to complete the tutorial and engage in one project.

Este tutorial interactivo presenta el **quién**, el **qué**, el **cómo** y el **por qué** de la ciencia ciudadana. Aproximadamente 30 minutos para completar el tutorial y participar en un proyecto. Haga clic en el botón de arriba para participar.

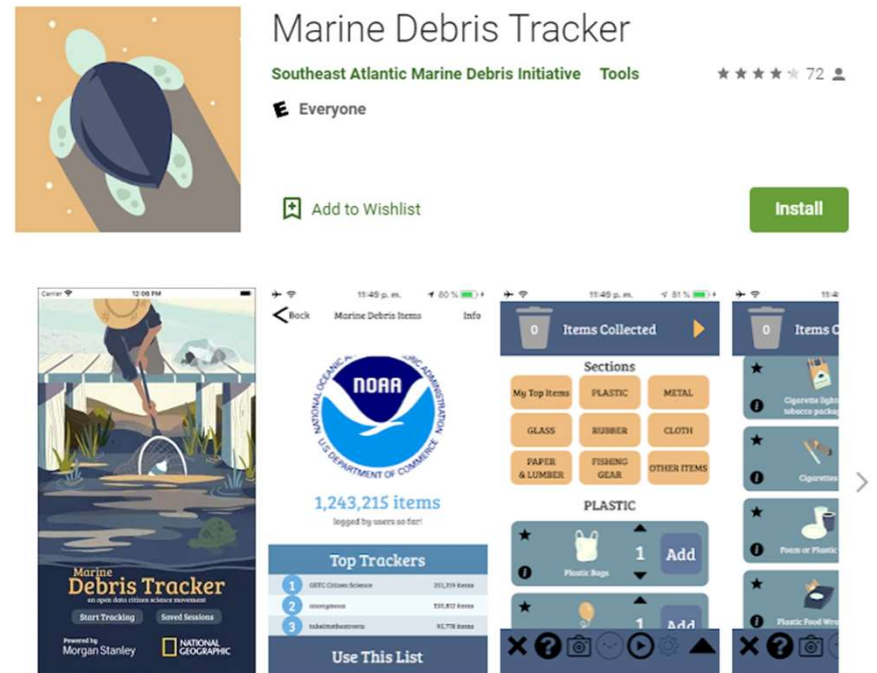
Stall Catchers

- Developed by researchers at Cornell University
- Online game to identify images where blood flow has stalled in the brain
- Create (or join) a team, and track your impact on research



Debris Tracker

- App for iOS and Android
- Track debris or litter
- Provides scientists with data about debris and plastic pollution in inland and coastal areas



2

WHEN IS PLASTIC A PROBLEM?

Plastics have become a huge pollution problem that won't go away easily in our country or in many other parts of the world. Use this true or false quiz to assess your plastic pollution understanding:

- T or F** Plastic discarded on land can get washed into rivers and end up in the ocean.
- T or F** Plastic can harm animals in the environment through ingestion or entanglement.
- T or F** Scientists estimate that 8 million metric tons of plastic enter our oceans every year.
- T or F** Scientists have found plastics in the depths of the world's oceans and at the summits of some of the world's highest mountains.
- T or F** 50 percent of plastic used globally is used only once, and then is discarded.

How did you do? The answers to all of the questions above are true!

Why do you think action is needed around plastic pollution locally?

Why do you think action is needed around plastic pollution globally?

6

ACTION STEPS

Of what you learned today, what is most important to you?

How will you use this learning in real-life scenarios?

MAKE A PLEDGE!

Write one or two pledges for combating plastic pollution.

Thank you for helping to fight plastic pollution.

Share your stories on social media: #EXPEDITIONPLASTIC



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Morgan Stanley



भारतीय वन्यजीव संस्थान
Wildlife Institute of India

PLASTIC POLLUTION ACTION JOURNAL

NAME:

This six-step booklet is designed to help with thinking about our relationships to plastic and also plastic's relationship with our natural environment. Add your thoughts and ideas. Collect data, and analyze it. At the end, think about how we can all take action as individuals, and also together, locally to globally.

1

HOW IS PLASTIC PART OF MY LIFE?

Plastics are lightweight, durable, and long lasting. No wonder they are used for so many purposes in our daily lives. Think about how you use plastics:

I use these items...

... to do these things:



Plastic bag



Plastic bottle



Have you ever found plastic items to be a problem? Explain...

Citizen Science & Libraries: Fighting Plastic Pollution Through Citizen Science

OCTOBER 21 @

Join us online. Register at
bit.ly/DebrisTrackerNNLM

11-noon Pacific



scistarter
Science we can do together.

Image Credit: Rich Blickinsoop



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scistarter.org/education

Learn (5 minutes):

- Go to scistarter.org/education
- Explore 1 or 2 recommended projects

Share (5 minutes):

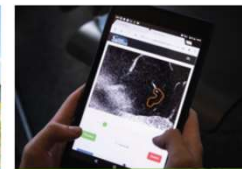
- Which projects would you like to try with your students?

Projects for Grades 6-8 and Up



INATURALIST

Help collect biodiversity data on the species you observe anywhere on the planet.



STALL CATCHERS

Accelerate Alzheimer's research by playing an online game.



GLOBE AT NIGHT

Help gather light pollution data.

Projects for Grades 9-12 and Up



MONKEY HEALTH EXPLORER

Evaluate the health of rhesus macaques as part of a larger study.



GLOBE OBSERVER

Help NASA scientists track changes in clouds, water, plants, and other life in support of climate research.



COCORAHS

Investigate extreme precipitation by measuring rain, hail, and snow.



Getting Started with Citizen Science



Introduction to the NLM and NNLM

Define citizen science

NLM and SciStarter

Citizen science in schools

- Examples of programs and resources

Information and Career Resources

Funding

Next steps and additional resources



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Citizen Science Toolkit

<https://www.calacademy.org/educators/citizen-science-toolkit>



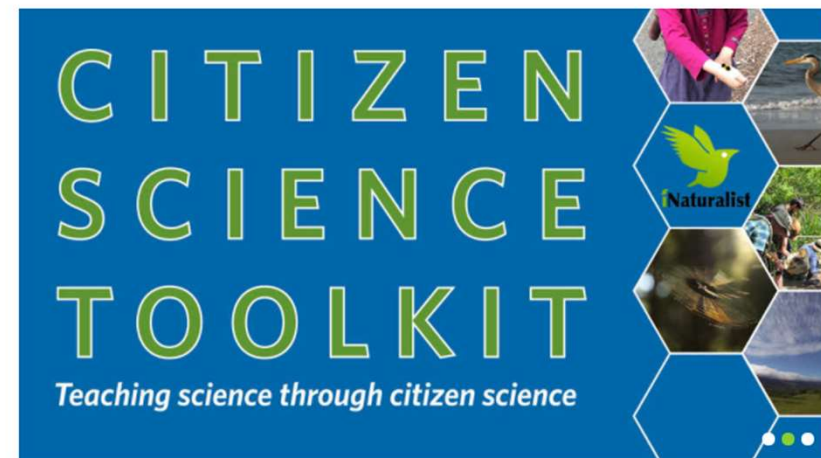
CALIFORNIA
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[Resources](#)

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Citizen Science Toolkit



[Download Toolkit](#)

Access the toolkit from your laptop, tablet, or other digital device. Simply download or print!

This toolkit is designed to help educators integrate citizen science projects into classroom curricula or afterschool programming.

It contains resources—including lessons, readings, and worksheets—to help communicate the value of citizen science to students and cultivate their sense of empowerment and impact when performing science investigations.



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Lesson Plan: 6th-12 grade

<https://www.calacademy.org/educators/lesson-plans/choose-your-own-citizen-science-project>

Search the Educators section

Search

Choose Your Own Citizen Science Project



Careers in Science interns collect and document a variety of species, including plants from the their own backyard, Golden Gate Park!

Appropriate for: 6th Grade - 12th Grade
Standards for: 6th Grade, 7th Grade, 8th Grade, 9th Grade, 10th Grade, 11th Grade, 12th Grade
Prep Time: 30 minutes
Activity Time: 120 minutes
Subjects: Constructing Explanations, Life Science

Attached Files

- ☒ Planning and Timeline
- ☒ Scientist's Notebook
- ☒ What Project Should We Pick

Did you know that everyday, students just like you are helping to answer real scientific questions? And they're having fun too! From searching the ocean's depths to tracking down insects to examining faraway galaxies, using data sheets and smartphones and online games, citizen scientists are engaged in a variety of interesting activities. There's bound to be a citizen science project that's right for you!

Activities

Get Inspired

What do you want to do?

Content Standards

NGSS: Science Practices

NGSS: Crosscutting Concepts



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Building citizen science kits for schools or libraries

<https://scistarter.org/library-resources>

Measuring Light In The Night

Globe at Night is a citizen science project to measure and monitor light pollution. With this kit, participants will learn how to use a Sky Quality Meter to measure light pollution and share data to help scientists study the impacts of light pollution on energy consumption, ecology, and human health.

[Visit project page](#)

PRINTABLE RESOURCES

-  [Measuring Light In The Night: Activity guide \(PDF\)](#)
-  [Measuring Light In The Night: Rack card \(PDF\)](#)
-  [Measuring Light In The Night: Check out card \(PDF\)](#)
-  [Measuring Light In The Night: Waiting list card \(PDF\)](#)
-  [Measuring Light In The Night: Flier - 8.5 x 11 \(PDF\)](#)
-  [Measuring Light In The Night: Bookmark - 2.5 x 8.5 \(PDF\)](#)
-  [Measuring Light In The Night: Box labels \(PDF\)](#)
-  [Borrowing Agreement \(PDF\)](#)

BUILD THIS KIT

Approximate equipment cost: \$175

-  [Measuring Light In The Night: Supply list and assembly instructions \(PDF\)](#)



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Getting Started with Citizen Science



Introduction to the NLM and NNLM

Define citizen science

NLM and SciStarter

Citizen science in schools

Information and Career Resources

- List of resources

Funding

Next steps and additional resources



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<https://medlineplus.gov/>

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Find information on health, wellness, disorders and conditions

Drugs & Supplements
Learn about prescription drugs, over-the-counter medicines, herbs, and supplements

Genetics
From Genetics Home Reference
Explore genetic conditions, genes, and more

Medical Tests
Learn why your doctor orders medical tests and what the results may mean

Medical Encyclopedia
Articles and images for diseases, symptoms, tests, treatments

Healthy Recipes
Try these recipes as part of a healthy lifestyle

Share MedlinePlus    

Genetics Home Reference is now part of MedlinePlus!
Learn about genetic conditions and genes with the new **MedlinePlus Genetics**.

1 2 3 4 ▶

Tweets by @MedlinePlus

MedlinePlus.gov @medlineplus
Do you ever wonder why the doctor listens to your heart with a stethoscope or squeezes your arm with a blood pressure cuff before a check-up? They are assessing your vitals! Learn more about what your vital signs can mean: ow.ly/rAJH50BgkQT

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 [Easy-to-Read Materials](#)  [Organizations and Directories](#)  [Health Information in Multiple Languages](#)  [MedlinePlus Connect for EHRs](#)

MedlinePlus: Genetics Primer

<https://medlineplus.gov/genetics/understanding/>

NIH U.S. National Library of Medicine

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Home → Genetics → Help Me Understand Genetics

Help Me Understand Genetics

From Genetics Home Reference. [Learn more](#)

An introduction to fundamental topics related to human genetics, including illustrations and basic explanations of genetics concepts.



Cells and DNA



Mutations and Health



How Genes Work



Inheriting Genetic Conditions



Genetics and Human Traits



Genetic Consultation



Genetic Testing



Direct-to-Consumer Genetic Testing





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MedlinePlus:

Environmental Health

<https://medlineplus.gov/environmentalhealth.html>

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Environmental Health

On this page

Basics <ul style="list-style-type: none">SummaryStart HerePrevention and Risk FactorsLearn MoreTreatments and Therapies	Learn More <ul style="list-style-type: none">Related IssuesSpecifics	See, Play and Learn <ul style="list-style-type: none">No links available
Research <ul style="list-style-type: none">Statistics and ResearchClinical TrialsJournal Articles	Resources <ul style="list-style-type: none">Find an Expert	For You <ul style="list-style-type: none">ChildrenTeenagers



Summary

Our environment affects our health. If parts of the environment, like the [air](#), [water](#), or soil become polluted, it can lead to health problems. For example, asthma pollutants and chemicals in the air or in the home can trigger asthma attacks.




Some environmental risks are a part of the natural world, like [radon](#) in the soil. Others are the result of human activities, like [lead poisoning](#) from paint, or exposure to [asbestos](#) or [mercury](#) from mining or industrial use.


NIH: National Institute of Environmental Health Sciences

Start Here


- [Environmental Health Topics from A to Z](#)  (National Institute of Environmental Health Sciences)
Also in Spanish
- [Tox Town](#)  (National Library of Medicine)

Prevention and Risk Factors

- [Dioxins](#)  (National Institute of Environmental Health Sciences)
- [Flame Retardants](#)  (National Institute of Environmental Health Sciences)
- [Harmful Algal Blooms](#)  (National Institute of Environmental Health Sciences)



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Kids Environment Kids Health <https://kids.niehs.nih.gov/>

 An official website of the United States government [Here's how you know](#) ✓


 National Institute of Environmental Health Sciences


Kids Environment Kids Health


 Topics  Games  Activities  Lessons


Discover, Explore, Learn

A resource for kids, parents, and teachers to find fun and educational materials related to health, science, and the environment we live in today.



 **Environment & Health**

 **Songs**

 **Coloring**

United Nations Environment: Beat Plastic Pollution

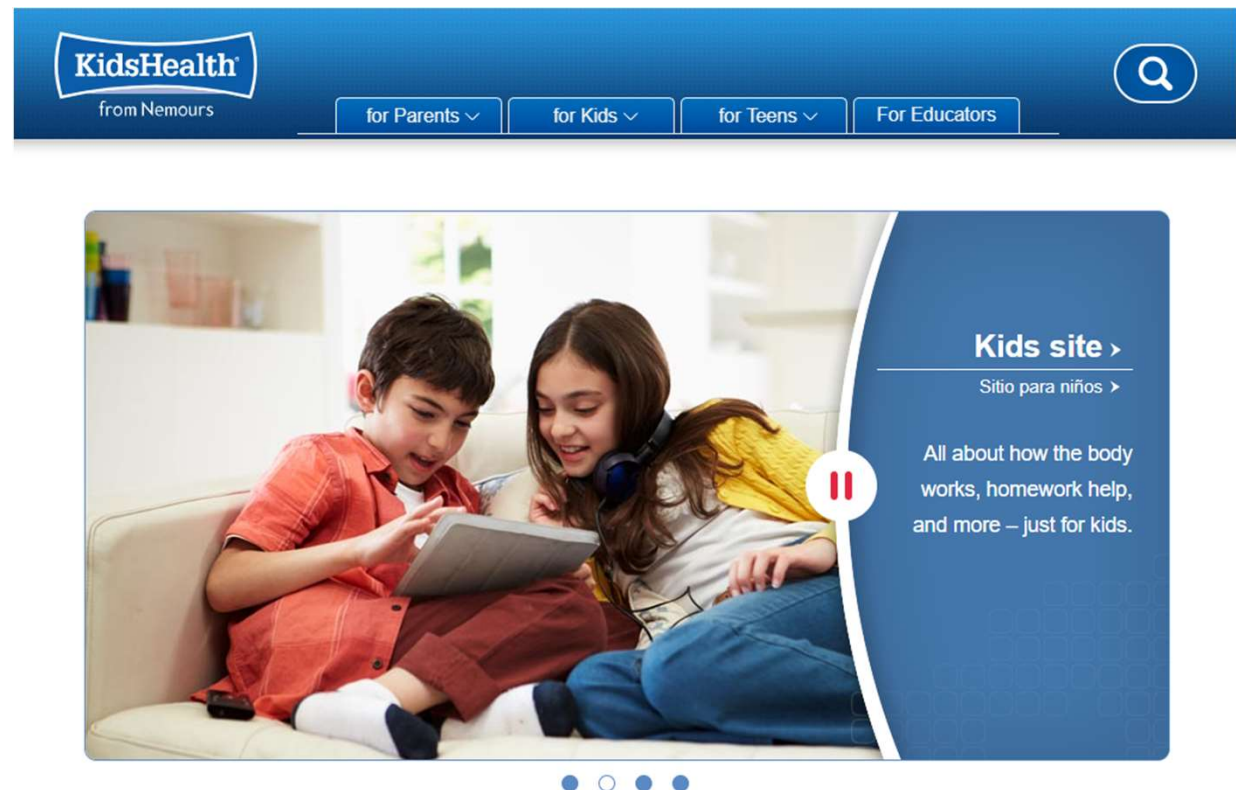
<https://www.unenvironment.org/interactive/beat-plastic-pollution/>



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KidsHealth from Nemours


kidshealth.org





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National Institute on Aging:

<https://www.nia.nih.gov/health>

 U.S. Department of Health & Human Services

 National Institute on Aging

Search 

COVID-19 is an emerging, rapidly evolving situation.
Get the latest public health information from CDC: <https://www.coronavirus.gov>
Get the latest research information from NIH: <https://www.nih.gov/coronavirus>
NIH Staff guidance on coronavirus (NIH ONLY)

HEALTH INFORMATION

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Alzheimer's Disease & Related Dementias

Alzheimer's disease is the most common cause of dementia in older adults. It is a progressive brain disorder that slowly destroys memory and thinking skills. It is not a normal part of aging. Learn more about the disease, and get news, tips, and resources for caregivers and health care professionals below. [Find resources in Spanish here.](#)



Occupational Outlook Handbook

<https://www.bls.gov/ooh/>

An official website of the United States government [Here is how you know](#) ▼

United States Department of Labor

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OOH HOME | OCCUPATION FINDER | OOH FAQ | OOH GLOSSARY | A-Z INDEX | OOH SITE MAP

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Occupational Outlook Handbook > Life, Physical, and Social Science >

Medical Scientists [PRINTER FRIENDLY](#)

Summary What They Do Work Environment How to Become One Pay Job Outlook State & Area Data Similar Occupations More Info

Summary

Quick Facts: Medical Scientists	
2019 Median Pay	\$88,790 per year \$42.69 per hour
Typical Entry-Level Education	Doctoral or professional degree
Work Experience in a Related Occupation	None
On-the-job Training	None
Number of Jobs, 2019	138,300
Job Outlook, 2019-29	6% (Faster than average)
Employment Change, 2019-29	8,400

What Medical Scientists Do

Medical scientists conduct research aimed at improving overall human health.

Work Environment

Medical scientists work in offices and laboratories. Most work full time.

How to Become a Medical Scientist

Medical scientists typically have a Ph.D., usually in biology or a related life science. Some medical scientists get a medical degree instead of, or in addition to, a Ph.D.

Pay


The median annual wage for medical scientists was \$88,790 in May 2019.

Job Outlook

Employment of medical scientists is projected to grow 6 percent from 2019 to 2029, faster than the average for all occupations. Medical scientists will continue to be needed because they contribute to the development of treatments and medicines that improve human health.

State & Area Data

Explore resources for employment and wages by state and area for medical scientists.



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National Geographic: Explorer Classroom

<https://www.nationalgeographic.org/education/student-experiences/explorer-classroom/>

AGES 4-8

EXPLORER CLASSROOM FOR PREK-2

Live events recommended for
ages 4-8 every Monday at
11:00AM ET starting September 21

[See All Past Events](#)



Ancient Animals | Sebastián Rozadilla

September 28th | 11:00AM ET

Sebastián Rozadilla is a paleontologist who studies animals that lived millions of years ago. He has searched southern Chile for new and unusual fossils. Join him to learn about the extinct ancient animals, like dinosaurs, that once roamed our Earth!

This event is recommended for learners in grades PreK-2.

[Register](#) | [Watch](#) | [Event Guide](#)



The Life of a Sea Turtle | Vanessa Bezy

October 5th | 11:00AM ET

What is it like to be a sea turtle? Join marine biologist Vanessa Bezy to find out! She'll teach us all about the sea turtles she studies and protects in Costa Rica.

This event is recommended for learners in grades PreK-2.

[Register](#) | [Watch](#)



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Citizen Science, Live Steam Events

Citizen Science & Libraries: Online Event Series

Join us this Fall! First hour of each event is **open to all** & the last half hour is geared toward event facilitators, library staff & **community leaders**.

Turn your **curiosity** about health issues into **impact** with citizen science!

Different projects featured at each event. Accessibility options available. One event offered in English and Spanish.

Learn more & RSVP:
SciStarter.org/NLM



- Wed., Oct. 21, 11am-12:30 PT
 - Fight Plastic Pollution Through Citizen Science Online (Debris Tracker)
- Wed., Nov. 18, 11am-noon PT
 - Create Your Own Air Quality Sensor with CanAir.io (CanAir.io, program in English and Spanish)
- Wed., Dec. 16, 11am-12:30 PT
 - Help Develop RNA-based Medicines Online (Eterna)



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Learn about the research process

<https://whatsinyourbackyard.org/discover/>

Discover



TRACK YOUR SAMPLE

Visit ShareOK to track your sample and view others.



THE PROCESS & RESEARCH

What happens when your soil arrives at the OU?



EDUCATORS & PARENTS

Find curriculum guides and request group participation.



VIDEOS

Visit our YouTube channel to learn more from the NPDG.



U.S. National Library of Medicine
National Network of Libraries of Medicine
Pacific Northwest Region

Getting Started with Citizen Science



Introduction to the NLM and NNLM

Define citizen science

NLM and SciStarter

Citizen science in schools

Information and Career Resources

Funding

- NNLM Funding
- Partnership ideas

Next steps and additional resources



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Finding funding

- **NNLM Funding** <https://nnlm.gov/pnr/funding>
- School or community foundations
- Federal agencies:
 - **Environmental Protection Agency**
<https://www.epa.gov/citizen-science/funding-opportunities-citizen-science-projects>
 - **National Science Foundation**
https://www.nsf.gov/funding/education.jsp?fund_type=4
 - **US Forest Service**



Partnerships for learning

- Museums
- Libraries
- Parks
- Schools, colleges, universities
- Health clinics
- Non-profits
- Others?



Getting Started with Citizen Science



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Define citizen science

NLM and SciStarter

Libraries and citizen science

Information and Career Resources

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Next steps and additional resources

- Upcoming webinars
- More information resources



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Citizen Science, Live Steam Events

Citizen Science & Libraries: Online Event Series

Join us this Fall! First hour of each event is **open to all** & the last half hour is geared toward event facilitators, library staff & **community leaders**.

Turn your **curiosity** about health issues into **impact** with citizen science!

Different projects featured at each event. Accessibility options available. One event offered in English and Spanish.

Learn more & RSVP:
SciStarter.org/NLM



- Wed., Oct. 21, 11am-12:30 PT
 - Fight Plastic Pollution Through Citizen Science Online (Debris Tracker)
- Wed., Nov. 18, 11am-noon PT
 - Create Your Own Air Quality Sensor with CanAir.io (CanAir.io, program in English and Spanish)
- Wed., Dec. 16, 11am-12:30 PT
 - Help Develop RNA-based Medicines Online (Eterna)



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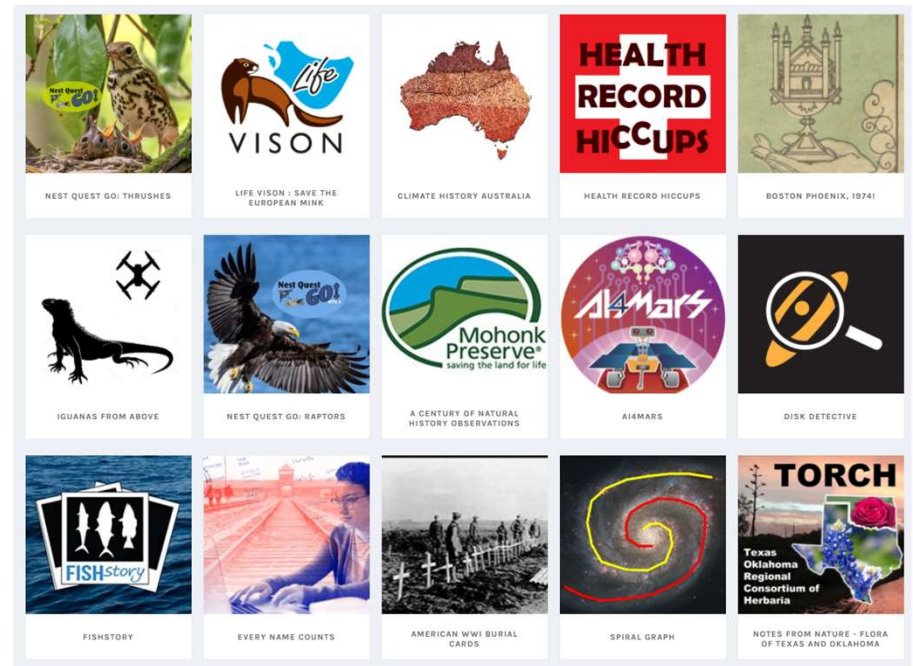
More Info about Citizen Science

- [Citizen Science Association](http://www.citizenscience.org/) (<http://www.citizenscience.org/>)
- [European Citizen Science Association](https://ecsa.citizen-science.net/) (<https://ecsa.citizen-science.net/>)
- [CitSci.org](http://citsci.org) (citsci.org)
- [Citizen Science discussion list](http://www.citizenscience.org/elist/) (<http://www.citizenscience.org/elist/>)
- [Citizen Science Conference](http://www.citizenscience.org/association/conferences/) (<http://www.citizenscience.org/association/conferences/>)



Find Citizen Science Projects

- National Geographic:
<https://www.nationalgeographic.org/idea/citizen-science-projects/>
- Zooniverse: <https://www.zooniverse.org/>
- NASA:
<https://science.nasa.gov/citizenscience>
- SciStarter: <https://scistarter.org/>



Questions?

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